FOCUS

Using products of the Strategic Highway Research Program to build better, safer roads . April/May 1999

Superpave **Software Version** 2.0 Nears Release

The new Superpave volumetric mix design software, known as Superpave Software Version 2.0, is scheduled to make its debut this summer. The software, which runs under the Windows 95 and the Windows NT operating systems, allows users to design asphalt mixes in conformance with the Superpave mix design procedures. The program contains five modules:

* Volumetric mix design procedures
- Field quality control (QC) procedures
- Field quality assurance (QA) procedures
- Binder classification procedures
- Test data entry procedures

The modules for QC / QA are some of the most important new features in Version 2.0. "Not only can you keep track of your mix design, but you can also check QC / QA in the field," says Katherine Petros of the Federal Highway Administration (FHWA). The software has also been revised to include the new simplified compaction levels recommended by the Asphalt Mix Expert Task Group and the Superpave Lead States team. (The revised compaction table will be published as part of an update to the American Association of State Highway and Transportation Officials [AASHTO] provisional specifications in May.)

Final revisions to the software, which will incorporate all of the recently approved AASHTO specification changes, are currently being made. The final changes are being done under the guidance of National Cooperative Highway Research Program Project 9-19 (Superpave Support and Performance Models Management). It is anticipated that when completed, the software will be included in the AASHTOWare line of software.

The Superpave software was originally created under a Strategic Highway Research Program (SHRP) project that involved teams of researchers from the Texas Transportation Institute, University of Texas at Austin, Deighton & Associates, University of California-Berkeley, Pennsylvania State University, and University of Florida. Version 1.0 of the software, a cleaned-up version of the DOS-based software developed under SHRP, was released by FHWA in 1996. Since that release, the University of Maryland Superpave models team has worked under an FHWA contract to refine and enhance the software and make it easier to use. The latest version has undergone field testing by a team of engineers from highway agencies and contractors.

"The Superpave software will provide the industry with a fantastic amount of useful information," says Larry Michael of the Maryland State Highway Administration and a member of the Superpave Lead States team. "We're eager-and our contractors are eager-to begin using the software, which will give us a standardized platform for designing Superpave mixes."

For more information, contact Katherine Petros at FHWA, 415-744-0652 (fax: 415-744-2620; email: katherine.petros@fhwa.dot.gov).

Inside...

U.S. Department of Transportation
Federal Highway Administration

SHRP

Meeting the Customers' Needs for Safer, Smoother Roads

For highway agencies across the country, maintaining and rehabilitating aging roads no longer has to mean a completely disrupted traffic flow or endless delays for drivers. Using everything from nontraditional work schedules to innovative contracting procedures, State and local agencies are better serving their customers and keeping traffic moving by getting maintenance and rehabilitation work done more safely, quickly, and efficiently.

As they change their approach to conducting roadway work, the first question that agencies ask themselves is "What do customers want?" In a nationwide survey sponsored by the National Quality Initiative, highway users identified pavement condition as the top priority for improving roads. In addition to smoother roads, they also want fewer traffic delays and disruptions caused by work zones. Such disruptions are not only inconvenient, but they carry a steep price. On many urban highway reconstruction projects, delays cost road users more than $50,000 a day in lost time and late deliveries.

To look at how maintenance and rehabilitation projects can be accomplished more quickly and efficiently, and to better address the problems of traffic disruption and work zone safety, the Federal Highway Administration (FHWA) conducted a national quality improvement review last year. The review team met with 26 State highway agencies, as well as local transportation departments and industry and user groups. Areas reviewed included work-zone traffic control plans, materials selection, contracting procedures, and the level of public participation in traffic management policies and decisions.

The review team found a number of successful strategies that States, cities, and counties are using to better serve their customers (see sidebar).

State and local highway agencies are also placing more emphasis on preventive maintenance strategies that can extend a pavement's service life and lengthen the time between necessary major rehabilitation work. With timely preventive maintenance, the useful life

BEST PRACTICES

FHWA's national quality improvement review team identified a number of best practices that State and local highway agencies are using across the country to improve their maintenance operations. For example, the Summertime Bridge Reconstruction Program in Cobb County, Georgia, is designed so that bridge replacement projects affecting school bus routes begin after the last day of the school year and are completed before the beginning of the following school year. This minimizes inconvenience to students and encourages contractors to work as efficiently as possible.

In New Jersey, a State trooper unit is assigned full time to State Department of Transportation (DOT) construction projects to assist with traffic control and improve work zone safety. North Carolina DOT has a public information program, known as IMPACT, that informs motorists, businesses, and residents of upcoming road construction and encourages them to use alternate routes. The city of Columbus, Ohio, has similarly improved communications with the public by establishing community advisory councils for large highway projects. The advisory councils include representatives from businesses, neighborhood associations, and other interested parties.

Innovative contracting procedures are also cutting the time spent on rehabilitation projects. Some jurisdictions, for example, are using the lane rental method. The contractor is assessed a rental fee based on road user costs for each day traffic is disrupted by lane or shoulder closures. This encourages contractors to schedule their work so that traffic disruptions are minimized.

To cut down on traffic disruption and increase efficiency, Oregon DOT used new contracting procedures to award a contract for rehabilitating a bridge on Interstate 5. The contract award was based upon both the price of bids and contractor qualifications. Previously, all contracts had been awarded solely on the basis of the lowest bid.

Several States have successfully used road closures to complete road work faster. The Washington State DOT completely closed a 9.6-km (6-mi) stretch of Interstate 405 on two consecutive weekends during the summer of 1997 for rehabilitation work. The public responded favorably, preferring the temporary road closure to a protracted series of backups. And by cutting a full construction season off what was to be a 3-year contract, the State saved hundreds of thousands of dollars.

of highway pavements can be extended by 5 to 10 years at one-sixth the cost of conventional pavement rehabilitation or reconstruction.

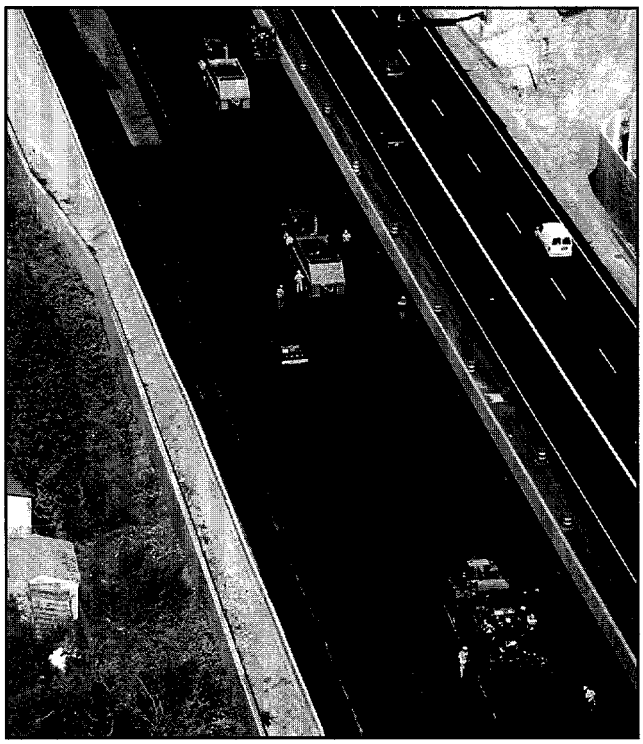
More information on the best practices identified by the review team can be found on FHWA's Web site (www.fhwa.dot.gov/quality/BestPrac.htm) and in the team's report, *Meeting the Customer's Needs for Mobility and Safety During Construction and Maintenance Operations* (Publication No. FHWA-PR-98-01-A). To obtain a copy of the report, contact the Research and Technology Report Center at 301-577-0818 (fax: 301-577-1421).

The lessons learned from FHWA's review are being incorporated into a new program called "Optimizing Highway Performance: Meeting the Customers' Needs." The goal is to work with State, local, and industry partners to improve construction and maintenance operations and ensure smoother, safer travel. This goal reflects FHWA's 1998 Performance Plan, which called for a 20 percent reduction in delays and highway-related fatalities and serious injuries on Federal-aid highways over the next 10 years.

The new program has seven interlocking components, each designed to improve highway operations. They are:

- project organization and management
- programming and project scheduling
- project development and design
- contracting methods and procedures
- traffic control methods
- innovative materials, technologies, and practices
- outreach

The outreach component, which will encompass hands-on workshops, training courses, and field tests, will be particularly important in disseminating information on new technologies and practices. For more information on the program, contact Jim Sorenson at FHWA, 202-366-1333 (fax: 202-366-9981; email:james.sorenson@fhwa.dot.gov).



By completely closing a 9.6-km (6-mi) stretch of Interstate 405 on two consecutive weekends, Washington State DOT was able to complete rehabilitation work faster.

PAVEMENT SMOOTHNESS ENHANCED BY NEW EQUIPMENT

Highway agencies are also better serving their customers by enhancing pavement smoothness, which both improves driver comfort and increases pavement life expectancy. New lightweight equipment for measuring initial pavement smoothness is faster and more accurate than traditional measurement methods. This profiling equipment automates data collection and analysis, providing test results instantaneously. And the profilers can be used within hours after paving, enabling States and contractors to control the quality of the construction and take immediate corrective action if necessary. This can help save significant amounts of time and money on road construction and resurfacing projects.

Working with the American Association of State Highway and Transportation Officials, National Asphalt Pavement Association, American Concrete Pavement Association, Road Profilers Users Group, and others, FHWA is helping to accelerate the use of the advanced profiling equipment, as well as the development and implementation of common standards for pavement smoothness. FHWA has partnered with six State highway agencies to field test, evaluate, and document the effectiveness of select lightweight profiling equipment in comparison with the States' existing practices. FHWA is also developing a technical guide that will include information on the costs and benefits of constructing smoother pavements and the most appropriate methods of measuring pavement smoothness.

New TRB Committee To Coordinate Superpave Implementation Efforts

Efforts by States, the American Association of State Highway and Transportation Officials (AASHTO), and the Federal Highway Administration (FHWA) to forge ahead with implementation of the Superpave mix design system have received a boost with the formation of the new Transportation Research Board (TRB) Superpave Committee. The future of Superpave implementation was in doubt with the passage of the Transportation Equity Act for the 21st Century last year, which failed to provide sufficient funds for FHWA to continue many ongoing, nor initiate many planned, Superpave development and deployment projects.

Many of those projects will now be funded through the State-sponsored National Cooperative Highway Research Program. FHWA is also continuing to use previously appropriated funds to support Superpave implementation. The new Superpave Committee will monitor and help coordinate these varied activities.

The committee will advise AASHTO and FHWA on implementation and research tasks, conduct program reviews, and monitor the financial needs for work remaining to be done. The committee's recommendations will be released in regular reports to AASHTO and FHWA.

The committee, which held its first meeting in March, plans to meet twice annually. Between meetings, "it will work closely with such groups as FHWA's Superpave Technology 'Delivery Team and the AASHTO Superpave Lead States Team, as well as partners like the National Asphalt Pavement Association and the Asphalt Institute," says Neil Hawks, the TRB staff representative to the committee.

The committee will work closely with such groups as FHWA's Superpave Technology Delivery Team and the AASHTO Superpave Lead States Team, as well as partners like the National Asphalt Pavement Association and the Asphalt Institute.

Joe Mickes, recently retired as chief engineer of the Missouri Highway and Transportation Department, is serving as chairman of the committee. Other members represent State and local governments, industry, and academia (see sidebar). FHWA, AASHTO, the National Asphalt Pavement Association, and other organizations will also provide liaisons to the committee.

For more information,' contact Neil Hawks at TRB, 202-334-1430 (fax: 202-334-3471; email: nhawks@nas.edu).

TRB SUPERPAVE COMMITTEE MEMBERS

Martin Barker
City of Albuquerque Public Works Department

Wade Betenson
Utah Department of Transportation (DOT)

Frank Danchetz
Georgia DOT

Fred Fehsenfeld
Heritage Research Group

Eric Harm
Illinois DOT

Dallas Little
Texas Transportation Institute

Don Lucas
Indiana DOT

Paul Mack
New York State DOT, and leader of the Superpave Lead States team

Joe Mahoney
University of Washington

Charles Marek
Vulcan Materials Company

John Metcalf
Louisiana State University

Joe Mickes
Missouri Highway and Transportation Department (retired) (chairman)

Gale Page
Florida DOT

Charles Potts
APAC, Inc.

Douglas Rose
Maryland State Highway Administration

Byron Ruth
University of Florida

Virginia HPC Bridge Construction: A Learning Experience

Ten years ago, high-performance concrete (HPC) bridges were nothing more than a concept. Five years ago, they became an experiment. Today, they are on their way to becoming an accepted, cost-effective technology. That's what Virginia Department of Transportation (DOT), a pioneer in the use of HPC for bridges, is finding.

A member of the HPC Lead States team, Virginia has participated in the Federal Highway Administration's HPC bridge showcase program, which was designed to give States an opportunity to see how they can benefit from using the new technology. As part of the program, Viiginia built seven HPC bridges. In 1998, the DOT had 20 HPC bridges under construction or in the design stage.

Celik Ozyildirim of the Virginia Transportation Research Council says that as contractors and the State DOT become more experienced with HPC, "the reduced number of beams and smaller cross-sections possible with HPC will lead to significant cost savings and longer service life."

According to Vince Campbell of Bayshore Concrete Products Corporation, who fabricated the concrete components for an HPC bridge over the Appomattox River on State Route 10, the project was "a valuable learning experience." As contractors gain experience in building HPC bridges, Campbell says the construction process will become even more efficient. He notes that although HPC projects sometimes cost a bit more up front, the significantly longer life span will offset those costs.

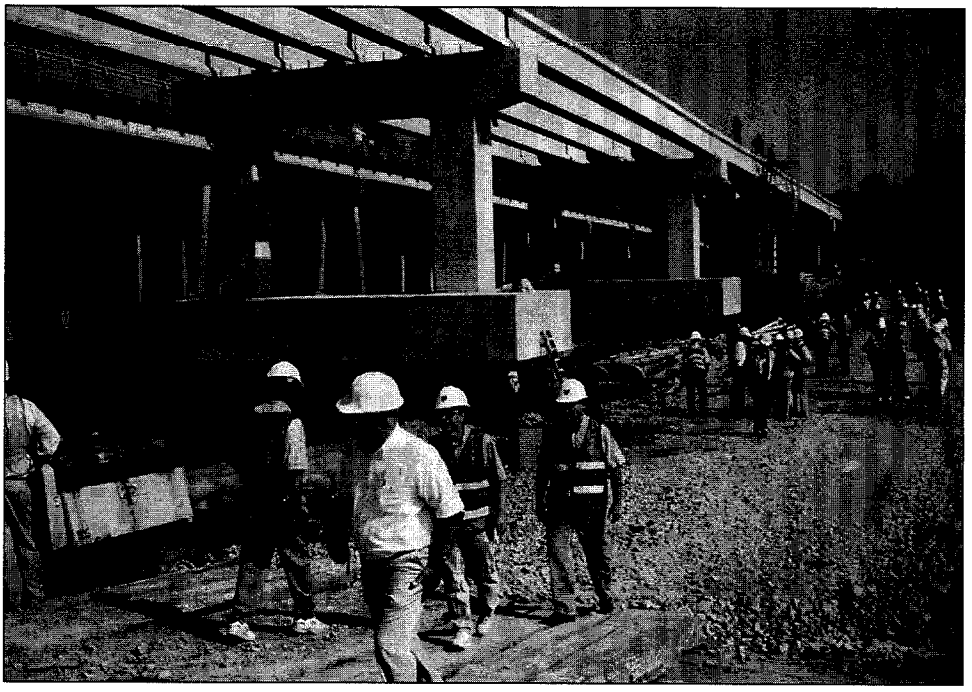
"HPC will clearly save money in the long run when we start taking full advantage of its potential," he says. "HPC is causing us to rethink what has been done in the past and to start looking 5 to 10 years into the future. As we get more practice, we'll get superstructure costs down, and with longer spans, we'll get the foundation costs down as well."

For example, the 24-m (80-ft) two-lane HPC bridge that carries Route 40 over the Falling River has five beams compared with the seven beams that would have been needed if it had been designed with conventional concrete. The project cost approximately 4 percent less than a conventional bridge.

Similar savings were realized on an HPC bridge built in 1997 on Virginia Avenue over the Clinch River in Richlands. With conventional construction techniques, the two-span bridge would have required seven girders on each span. By eliminating four girders from the two spans, the HPC design saved money.

For more information on HPC use in Virginia, contact Celik Ozyildirim at 804-293-1977 (fax: 804-293-1990). For more information on the Route 10 bridge construction, contact Vince Campbell at Bayshore, 757-331-2300 (fax: 757-331-2501).

HPC is concrete that has been designed to be more durable, stronger, and cost-effective than conventional concrete. This allows bridges to have longer spans and smaller or fewer structural components. The mixes are composed of essentially the same materials as conventional concrete, but the proportions are designed to provide the strength and durability needed for the structural and environmental requirements of the project. The improved durability means that HPC bridges will require less maintenance and fewer repairs and last much longer than other bridges. It is estimated that HPC bridges could have a useful service life of 75 years or more.



The use of high-performance ***concrete for*** bridges ***received a*** boost ***in Virginio*** from a ***I997*** showcase ***in Richmond.***

New Grant Program Promotes Increased Integration of Transportation Systems with Community Needs

TCSP

Transportation and Community and System Preservation Pilot Program

Under a new pilot program managed by the Federal Highway Administration (FHWA), up to $25 million annually will be awarded over the next 5 years to help State and local governments plan and implement programs that better integrate transportation services with community needs. As communities place more of an emphasis on managing growth, reducing traffic congestion, and preserving green space, the Transportation and Community and System Preservation (TCSP) program will bolster these efforts by funding proposals that balance transportation initiatives with community development, environmental protection, and access to jobs and markets.

To provide managers, planners, and others in State and local agencies and metropolitan planning organizations, as well as their nongovernmental partners, with the chance to learn more about the TCSP program and the opportunities it presents for their communities, FHWA sponsored a 2-day workshop on May 11-12 in Denver, Colorado.

Workshop participants were provided information that will be useful in preparing TCSP grant applications. The call for proposals for fiscal year 2000 grants will be announced in the *Federal Register* this spring, and proposals will be due sometime this summer.

The TCSP program was created by the Transportation Equity Act for the 21st Century (TEA-21). It is designed to encourage activities that meet the following goals:

- Improve the efficiency of the transportation system
- Reduce the impact of transportation on the environment
- Reduce the need for costly future public infrastructure investments
- Provide people with better access to jobs, services, and trade centers
- Encourage private-sector development patterns that achieve the above goals

In 1998, the first year of the grant program, more than 500 proposals were submitted. Thirty-five grants totaling $13.1 million were awarded this spring. The grants will fund programs ranging from waterfront redevelopment in Troy, New York, to a transportation and community sustainability plan in Laurel, Montana. Other grant recipients include Kansas City, Missouri, Dayton, Ohio, and Johnson City, Tennessee.

As communities place more of an emphasis on managing growth, reducing traffic congestion, and preserving green space, the TCSP program will bolster these efforts.

The amount of TCSP funding for fiscal year 2000 could double to $50 million under the Clinton administration's new "Livability Agenda," which focuses on identifying tools and resources to preserve green space, ease traffic congestion, and pursue regional "smart growth" strategies.

FHWA's partners in implementing the TCSP program are the U.S. Department of Transportation's Federal Transit Administration, Federal Railroad Administration, Office of the Secretary, and Research and Special Programs Administration, and the Environmental Protection Agency.

For more information on the TCSP program, call the TCSP hotline at 800-488-6034 or visit the TCSP Web site at tcsp-fhwa.volpe.dot.gov/index.html.

SHRP Implementation Calendar

The following events are in support of products and technologies developed under the Strategic Highway Research Program.

Advanced Superpave Design and Construction Course

May 5–6, 1999, Wichita, KS

May 5-6, 1999, Charlotte, NC

May 12–13, 1999, Nashville, TN

May 12–13, 1999, Austin, TX

May 18–19, 1999, Baton Rouge, LA

May 19–20, 1999, Tampa, FL

This course is designed for personnel responsible for the mix preparation, production, and construction of Superpave projects. Attendees will use specially designed software to develop trial design aggregate structures and perform volumetric calculations.

Contact: The Asphalt Institute at 606-**288-4964** (fax: 606-288-4999; Web: www.asphaltinstitute.org).

National Quality Initiative (NQI) Lead States Team Meeting

May 24–25, 1999, St. Louis, MO

This meeting will bring together States experienced in developing public/ private partnerships to promote quality improvement in the highway industry. These States will discuss how they **can** best advise other highway agencies on using the NQI concept.

Contact: Bob Templeton at 877-526-9899 (fax: 512-301-9897; email: btemplenqui@aol.com).

FHWA Regional HPC Showcase

June 29-July 1, 1999, Auburn, AL

This high-performance concrete for bridges showcase highlights bridges under construction in Alabama, North Carolina, and Georgia.

Contact: Terry Halkyard at FHWA, **202-366-6765** (fax: 202-366-7909; email: terry.halkyard@fhwa.dot.gov) or Michael Stallings at Auburn University, 334-844-6276 (fax: 334-844-6290; email: michaels@eng.auburn.edu; Web: www.eng.auburn.edu/alhpc/ hpc.htm).

Lead States Workshop

August 30-31, 1999, St. Louis, MO

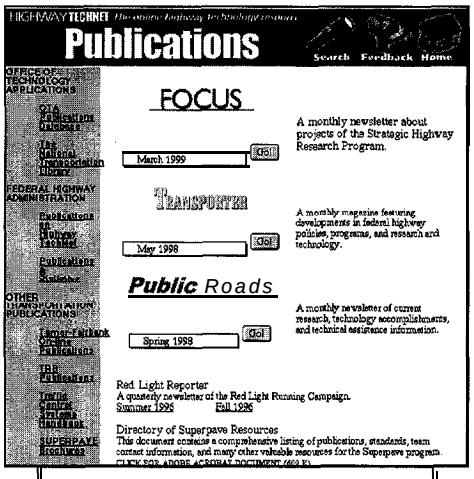
Contact: Haleem Tahir at AASHTO, 301-975-5275 (fax: 301-330-1956; email: haleem.tahir@nist.gov).

Fourth Annual Eastern Winter Road Maintenance Symposium and Equipment Expo

September 8–9, 1999, Albany, NY

The symposium and accompanying equipment expo are targeted at winter maintenance managers and other public works practitioners from cities, townships, counties, and States east of the Mississippi River, as well as staff from other public agencies and the private sector. The symposium will cover such topics as snow and ice control, road weather information systems, anti-icing techniques, and post-storm cleanup strategies. It is being cohosted by the New York State Department of Transportation and the Federal Highway Administration (FHWA).

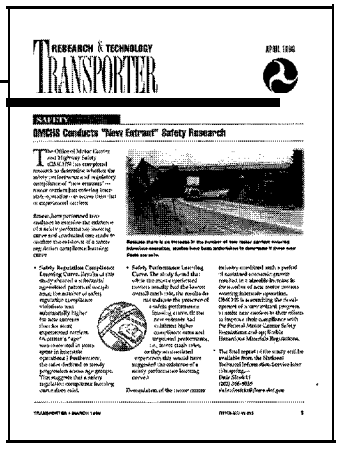
Contact: Deborah Vocke at FHWA, 410-962-0077, x. 3078 (fax: 410-962-3419; email: deborah.vocke@fhwa.dot.gov).



Focus on the Web

Misplace last month's copy of Focus? Searching for an article from 2 years ago? You can find issues stretching back to December 1995, as well as links to other FHWA publications, on the Web at www.ota.fhwa.dot.gov/pubs / index.html

To find out more about FHWA's research, development, and technology findings and accomplishments, as well as technology transfer opportunities, subscribe to the *Research & Technology Transporter*. This 8-page monthly newsletter is designed for transportation engineers and professionals in FHWA, State and local highway agencies, Local Technical Assistance Program centers, academia, and the research community. To subscribe, contact Judy Dakin at 202-493-3192 (email: judy.dakin @fhwa.dot.gov).


RESEARCH & TECHNOLOGY
TRANSPORTER
APRIL 1996
SAFETY
OMCSS Conducts "New Entrant" Safety Research

FOCUS (ISSN 1060-6637) is published monthly by the U.S. Department of Transportation's Federal Highway Administration (FHWA).

Federal Highway Administrator: Kenneth R. Wykle

Managing Editor: Bill Bolles
bill.bolles@fhwa.dot.gov

Editor: Kathryn Harrington-Hughes
Tel: 202-347-1414 (fax: 202-347-6938)
kathrynhh@harrington-hughes.com

Federal Highway Administration (HRTS)
6300 Georgetown Pike
McLean, VA 22101-2296

The Strategic Highway Research Program (SHRP) was established by Congress in 1987 as a 5-year, $150 million research program to improve the performance and durability of our Nation's highways and to make them safer for motorists and highway workers. As a follow-on program to SHRP, Congress established in the Intermodal Surface Transportation Efficiency Act of 1991 programs to implement SHRP products and to continue SHRP's long-term pavement performance (LTPP) program. FHWA is taking the lead in this effort through its SHRP Product Implementation Program and its adoption of SHRP's LTPP program.

Publication No. FHWA-RD-99-104

Send address corrections to Harrington-Hughes & Associates, Inc., 733 15th Street, NW, Suite 700, Washington, DC 20005; fax: 202-347-6938; email: dwells@harrington-hughes.com

U.S. Department
of Transportation

Federal Highway Administration

400 Seventh St., S.W.
Washington, DC 20590

Official Business
Penalty for Private Use $300

FIRST CLASS MAIL
POSTAGE AND FEES PAID
FEDERAL HIGHWAY
ADMINISTRATION
PERMIT NO. G-66